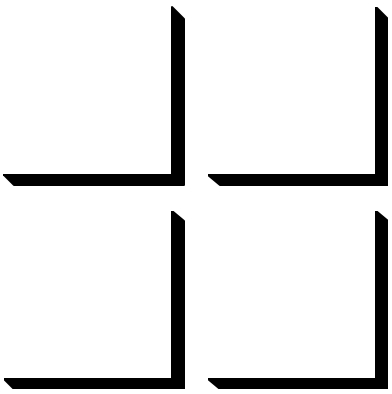


# APPENDIX: I

**GEOTECHNICAL INVESTIGATION**
**on**
**PROPOSED RESIDENTIAL DEVELOPMENT**
**Elmwood Property**
**Abel Street**
**Milpitas, California**
**for**
**KB HOME SOUTH BAY INC.**

DRAFT

**By**

***TERRASEARCH, inc.***

**Project No. 9978.G**
**24 September 2003**

Project No. 9978.G
24 September 2003

Mr. Kelly Beardslee
KB Home South Bay Inc.
6700 Koll Center Parkway
Suite 200
Pleasanton, CA 94566 94544

DRAFT

Subject: Proposed Residential Development
Elmwood Property
Abel Street
Milpitas, California
**GEOTECHNICAL INVESTIGATION**

Dear Mr. Beardslee:

In accordance with your authorization, ***TERRASEARCH, inc.*** has performed a geotechnical investigation at the subject site located in Milpitas, California.

The accompanying report summarizes our findings, conclusions and recommendations for use in geotechnical design and construction of the subject project. Our findings indicate that from a geotechnical point of view construction of the proposed development is feasible on the site provided the recommendations of this report are carefully followed and are incorporated into the plans and specifications.

Should you have any questions relating to the contents of this report or should additional information be required, please contact our office at your convenience.

Very truly yours,
***TERRASEARCH, inc.***

DRAFT

Simon Makdessi, G.E
Senior Engineer

Copies: 6 to Addressee

# TABLE OF CONTENTS

# GEOTECHNICAL INVESTIGATION

## Purpose and Scope

The purpose of this investigation was to evaluate the geotechnical conditions at the site of the proposed residential development along Abel Street in Milpitas, California. Based on the results of the investigation, criteria were established for the grading of the site, design of foundations for the proposed structures, and the construction of other related facilities on the property.

grading is not known, but given the relatively flat nature of the site, is expected to consist of minor cutting and filling to achieve design grade.

## Site Location and Description

The two parcels total approximately 29 acres in size. Topographically, the parcels are located within the alluviated flatlands of the Santa Clara Valley, and are relatively level in grade.

The west parcel is located on the west side of Abel Street north of the Elmwood Correctional Facility. It is bounded by existing residential development to the north, Abel Street and a drainage channel to the west, Hetch Hetchy Way to the south and vacant land to the west. The site is currently vacant land but the westerly portion was previously occupied by a golf driving range. Tall poles and netting and small structures are present on the westerly portion of the parcel. In some areas the small mounds are present. The surface of the site is disced and vegetation consists of a tall, dense coverage of anise plants and grass.



The east parcel is located on the west side of Abel Street and is bounded by Curtis Avenue to the south, existing commercial/retail businesses to the east and north. A strip grove of large mature trees from east to west divides the southerly side of the parcel from the northerly two thirds of the parcel. Along the south side for a distance of approximately 80 feet from the street, the surface is disturbed and appears to contain a thin cover of loose soil and landscape bark. The southern third of the parcel contains a sparse coverage of tumble weeds. The northern part of this parcel contains areas of disced native soil and areas covered by a thin layer of loose gravelly soil fill and sparse coverage of short grass. A manhole and transformer pad are present on the north western corner of the parcel.

This description of the site is based on a site reconnaissance by the Soil Engineer and a site plan provided by Ruggeri Jensen Azar Associates supplied by you.

## Geologic Setting

The subject site is within the Coast Ranges geomorphic province, a belt of sedimentary, volcanic, and metamorphic rocks, which extend from southern California to Oregon. The structural geology of the Coast Ranges is complex and dominated by transpressive stress (combined transform and compressional) concentrated along faults within the San Andreas Fault system. On the eastern portion of the San Francisco Bay, bedrock geology consists of sedimentary and metamorphic rocks ranging from Cretaceous through Quaternary periods (up to 144 million years to present).

The subject site is located immediately southeast of the intersection of Highway 880 and 237 and northwest of the Great Mall in Milpitas, California. Based on published materials by Helley (1979), the materials underlying the site consist of the subject property is underlain by Holocene fine-grained alluvium (Qhaf), which consists of unconsolidated, plastic, moderately to poorly sorted silt and clay rich in organic material, which is seasonally saturated and irregularly bedded. The fine-grained alluvium is generally less than 10 feet in thickness and was formed by standing floodwaters. Thick sequences of clay, silt, sand, and gravel underlie the fine-grained alluvium (up to 5 kilometers) and the thick sequence of alluvium is underlain by Franciscan Complex bedrock. The California Geological Society has release a series of maps that outline where liquefaction or earthquake-induced landslides could occur during a large earthquake. This property is located in a Zone of Required Investigation for liquefaction.



The trace of the Hayward Fault is situated approximately 3.9 kilometers (km) east of the site and is considered an active strike-slip fault with right lateral motion according to the Alquist-Priolo (AP) Earthquake Fault Zones Act (1994).

The site is not located within an AP zone but is located within a Seismic Hazard Zone (DMG, 1997). Other faults located within a 50 km radius of the site are shown on Table 1, based on the EQFAULT computer program by Thomas Blake.

## DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

### General

1. From a geotechnical point of view, construction of the proposed development on the two parcels is feasible provided the recommendations presented in this report are incorporated into the project plans and specifications.

2. The most prominent geotechnical features of the site are the presence of moderately expansive near-surface soils, potentially liquefiable deposits, and the presence of old fills. The effect of expansive, compressible, and liquefiable soils can adequately be controlled with appropriate structural design of foundations and civil design of surface grades and gradients for gravity-flow pipes. In the area of boring B3 the liquefiable layer is within 5 feet from the base of the expected foundation elevation. We recommend that in the area of boring B3 additional localized subsurface work be performed to evaluate the extent of the silty sand layer when building footprint and foundation locations are known, to evaluate if mitigation of this layer is needed.

3. It is our understanding that you prefer the detached residence structures to be founded on a post-tensioned slab foundation system, and the podium structure would likely be founded on a spread footing foundation system. Recommendations for both these systems are provided later under the heading "Foundations".



### Site Preparation

4. Prior to any grading, preparation of the site should be completed. Preparation would consist of removal of the transformer, abandonment of the manhole, removal of poles and small structures and grubbing of trees. Demolition of structures should include the complete removal of all surface and subsurface structures. Clearing and grubbing of all trees is required prior to grading and it is important that the grubbing operations remove the major root systems. **It is vital that**

***TERRASEARCH, inc.*** **intermittently observe the removal of subsurface structures and the grubbing operations to determine the extent and depth of excavations created by grubbing/excavation. We should be notified in ample time to ensure that no subsurface structures are covered and that the root systems from grubbing operations are completely removed. If *TERRASEARCH, inc.* is not contacted to observe the demolition and removal of subsurface structures, then further backhoe investigation will need to be performed prior to the commencement of mass grading.**

5. It is recommended that any excavations greater than one foot deep created during demolition or grubbing of trees in planned fill areas be left open for backfill during mass grading. If such excavations are covered or filled with loose material, then the areas will need to be subexcavated during mass grading and properly backfilled under our observation. Grubbed excavations one foot deep or less may be properly backfilled during site preparation activities described later

6. Excavations made by the removal of any structure, tree, or old fill should be backfilled under the observation of the Soil Engineer in accordance with the requirements for engineered fill. Any existing old loose fills, or soil deemed soft or unsuitable by the Soil Engineer, exposed by the demolition operations, shall be excavated and removed as required by the Soil Engineer during grading. Any resulting excavations should be properly backfilled with engineered fill under the observation of the Soil Engineer. If any excavations are loosely backfilled without our observation and these excavations are not located and backfilled with engineered compacted fill during grading, future settlement of the loose backfill will occur and may cause damage to structures and improvements.



**Grading**

3. The grading requirements presented herein are an integral part of the grading specifications presented in Appendix C of this report and should be considered as such.

4. Grading activities during the rainy season will be hampered by excessive moisture. Grading activities may be performed during the rainy season, however, achieving proper compaction may be

difficult due to excessive moisture; and delays may occur. In addition, measures to control potential erosion may need to be provided. Grading performed during the dry months will minimize the occurrence of the above problems.

5. At the current time the surface of the west parcel contains a dense coverage of vegetation while the east parcel contains a thin to moderate coverage of vegetation. Where a dense coverage of vegetation exists the vegetation may need to be stripped. Depending on the vegetation conditions at the time of grading, discing of the surface may be performed in lieu of stripping, or the dense cover can be mowed and then disced. An evaluation of whether stripping or discing will be needed will be made at the time that grading commences. Stripped material from the site may not be used as engineered fill but may be stockpiled and used later for landscaping purposes.

6. Following any required stripping, grubbing of trees, and removal of any loose and/or soft soil, the top 8 inches of exposed native ground for fill areas should be scarified, moisture conditioned as necessary, and compacted to a minimum degree of relative compaction of 90% at a moisture content 2 to 3 percent above optimum for the moderately expansive soil and 4 to 5 percent for the highly expansive clayey soil as determined by ASTM D1557-91 Laboratory Test Procedure. After recompacting the native subgrade, the site may be brought to the desired finished grades by placing engineered fill in lifts not to exceed 8 inches in uncompacted thickness and compacted to the relative compaction requirements in accordance with the aforementioned test procedure. All soil encountered during our investigation are suitable for use as engineered fill when placed and compacted at the recommended moisture content.



7. For lots in cut areas, it is recommended that the building footprint be compacted in place to obtain a minimum relative comapction of 90% in the upper one foot. This can be accomplished by either proof-rolling or directing the earthmoving equipment haul route to travel across the building forotprint area. In either case, the pad must be moisture-conditioned prior to compacting.

8. Should import material be used to establish the proper grading for the proposed development, the import material should be approved by the Soil Engineer before it is brought to the site. General import material may be of any type, but should preferably have an expansion potential

similar to or less than the on site native soil. The select import material should meet the following requirements:

a. Have an R-Value of not less than 25;
b. Have a Plasticity Index not higher than 12;
c. Not more than 15% passing the No. 200 sieve;
d. No rocks larger than 6 inches in maximum size;

9. It is recommended that any unsupported fill slopes less than 10 feet be constructed at inclinations no steeper than 2:1 (horizontal to vertical).

**Foundations**

10. A stated previously two types of foundation systems will be used depending on the type of structure. The podium style buildings will be supported on a spread footing foundation while the detached single family structures may be founded on a post-tensioned slab foundation system. Criteria for the design and construction of each system is presented in the following sections. The following recommendations are contingent upon adequate surface drainage being constructed as recommended in this report and as designed by the project Civil Engineer and maintained by the property owners at all times.



**Spread Footing Foundation**

11. Continuous and spread footing foundations should extend to a minimum depth of 248 inches below the lowest adjacent pad grade (trenching depth). At this depth, continuous footings may be designed for an allowable bearing pressure of 2,500 p.s.f. due to dead plus sustained live loads, and 3,200 p.s.f. due to all loads which include wind or seismic. Isolated spread footings for columns may be designed for an allowable bearing pressure of 2,800 p.s.f. due to dead plus sustained live loads, and 3,700 p.s.f. due to all loads which include wind or seismic. The specification of structural reinforcement for all foundations is to be performed by a structural engineer.

Differential Swell:

| | | |
|---|---|---|
| $Y_m$ (Edge Lift) | = | 1.5 inches |
| $Y_m$ (Center Lift) | = | 3.5 inches |

Project No. 9978.G Geotechnical Investigation / Elmwood Property, Milpitas 24 September 2003

12. The settlements of footings designed and constructed in accordance with the aforementioned criteria are estimated to be less than one inch. The differential settlement between individual column or wall footings can be estimated as the difference between the settlements at any two points and should not exceed one-half inch. As stated earlier, a differential settlement of 1 inch must be applied between the portion of the foundations spaced 50 feet apart.

13. Lateral loads resulting from wind or earthquake may be resisted in the form of passive pressure on the site of footings and friction between the bottom of the footings and soils on which these are supported. The passive soil resistance against footings may be taken equal to a fluid having an equivalent fluid pressure of 250 p.c.f. This assumes that the footings are placed neat against the soil face or that properly compacted backfill is placed in the space between the footings and the soil faces. A coefficient of friction of 0.30 may be used.

14. Resistance to uplift developed by lateral loads is provided by the weight of the soil above the footing having a density of 120 p.c.f..



**Post-Tensioned Slab Foundation**

a. Slabs should be underlain by a minimum of 4 inches of gravel or clean crushed rock material placed between the finished subgrade and the slabs to serve as a capillary break between the subsoil and the slab. See the "Guide Specifications For Rock Under Floor Slabs", Appendix C.

b. The thickness of the slab is to be determined by the structural engineer. Slabs should be properly reinforced to meet structural design criteria. The reinforcement shall be placed in the center of the slab unless otherwise designated by the design engineer.

c. Slabs supporting floor coverings should be provided with measures to prevent condensation caused by temperature differentials from harming floor coverings. One way to protect the floor covering is to place a vapor barrier membrane between the granular layer and the floor slab. In addition, two inches of wetted sand should be placed over the membrane to minimize puncture and facilitate curing of the concrete. The sand and the membrane are to be placed over the 4-inch layer of gravel or crushed rock recommended herein.

d. Slabs should be poured structurally independent of the foundations. A 30-pound felt strip, expansive joint material, or other positive separator should be provided around the edge of all floating slabs to prevent bond to the foundation.



**Retaining Walls**

20. If any retaining walls are to be constructed, they should be designed to resist lateral pressures exerted from a media having an equivalent fluid weight as follows:

| | | |
|---|---|---|
| Active Condition | = | 45 p.c.f. for horizontal backslope |
| At-rest Condition | = | 65 p.c.f. |
| Passive Condition | = | 250 p.c.f. |
| Coefficient of Friction | = | 0.30 |

21. For a non-horizontal backslope, the active condition equivalent fluid weight can be increased by 1.5 p.c.f. for each 2 degree rise in slope from the horizontal.

22. Active conditions occur when the top of the wall is free to move outward. At-rest conditions apply when the top of wall is restrained from any movement. It should be noted that the effects of any surcharge or compaction loads behind the walls must be accounted for in the design of the walls.

23. The above criteria are based on fully drained conditions. If drained conditions are not possible, then the hydrostatic pressure must be included in the design of the wall. A linear distribution of hydrostatic pressure of 63 p.c.f. should be adopted.

24. In order to achieve fully-drained conditions, a drainage filter blanket should be placed behind the wall. The blanket should be a minimum of 12 inches thick and should extend the full height of the wall to within 12 inches of the surface. If the excavated area behind the wall exceeds 12 inches, the entire excavated space behind the 12-inch blanket should consist of compacted engineered fill or blanket material. The drainage blanket material may consist of either granular crushed rock and drain pipe fully encapsulated in geotextile filter fabric or Class II permeable material that meets CalTrans Specification, Section 68, with drainage pipe but without fabric. A 4-inch perforated drain pipe should be installed in the bottom of the drainage blanket and should be underlain by at least 4 inches of filter type material. A 12-inch cap of clayey soil material should be placed over the drainage blanket.



25. As an alternate to the 12-inch drainage blanket, a pre-fabricated strip drain (such as Miradrain) may be used between the wall and retained soil. In this case, the wall must be designed to resist an additional lateral pressure of 30 p.c.f.

26. Piping with adequate gradient shall be provided to discharge water that collects behind the walls to an adequately controlled discharge system away from the structure foundation.

27. The retaining walls may be founded on either a spread footing foundation in accordance with the recommendations provided under the heading "foundations" or using a friction pier foundation using the criteria below.

Friction Pier:

28. The piers should be designed on the basis of skin friction acting between the soil and that portion of the pier that extends below a depth of three feet below finished grade. For the soils at the site, an allowable skin friction value of 500 p.s.f. can be used for combined dead and live loads. This value can be increased by one-third for total loads which include wind or seismic forces. Spacing should be determined as required by the load distribution, but minimum spacing should not be less than 3 pier diameters, center to center. Maximum spacing and the minimum depth of piers is to be determined by the Structural Engineer.

29. To resist lateral loads, the passive resistance of the soil can be used. The soil passive pressures can be assumed to act against the lateral projected area of the pier described by the vertical dimension of twice the pier diameter. It is recommended that a passive pressure equivalent of that of a fluid weighing 250 p.c.f. be used below one foot.

30. It is important that care be exercised to ensure that any concrete spills during the concrete pour must be removed and no "mushrooming" effects are allowed to remain around the top of the pier.



**Pavement Areas**

31. An R-value test was not performed, however, we are providing herein preliminary pavement sections for highly expansive clay subgrade. An R-value of 5 will be used for the expansive clay subgrade Based on this R-value, the recommended pavement sections for various Traffic Indices (TI) are tabulated as follows:

TABLE I

| Design Traffic Index | Asphalt Concrete Type B (inches) | Aggregate Base Class II[1] (inches) |
|---|---|---|
| 4.5 | 2.5<br>3.0 | 12.5<br>10.0 |
| 5.0 | 2.5<br>3.0 | 14.5<br>12.0 |
| 5.5 | 3.0<br>4.0 | 14.0<br>12.0 |
| 6.0 | 3.0<br>4.0 | 15.5<br>13.5 |
| 7.0 | 4.0<br>5.0 | 17.5<br>15.5 |

Note: [1]Minimum R-value = 78

32. Please note that the above design is preliminary. After rough subgrade is achieved, representative samples of soil must be collected and tested to determine the actual R-values so that a final actual design may be obtained.

33. After underground facilities have been placed in the areas to receive pavement and removal of excess material has been completed, the upper 6 inches of the subgrade soil should be scarified, moisture conditioned and compacted to a minimum relative compaction of 95% at a moisture content above optimum in accordance with the grading recommendations specified in this report. The pavement subgrade should not be allowed to dry excessively before covering with aggregate base.



34. All aggregate base material placed subsequently should also be compacted to a minimum relative compaction of 95% based on the ASTM D1557-91 Test Procedure. The construction of the pavement should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportation of the State of California and/or City of Milpitas, Department of Public Works.

12. The settlements of footings designed and constructed in accordance with the aforementioned criteria are estimated to be less than one inch. The differential settlement between individual column or wall footings can be estimated as the difference between the settlements at any two points and should not exceed one-half inch. As stated earlier, a differential settlement of 1 inch must be applied between the portion of the foundations spaced 50 feet apart.

13. Lateral loads resulting from wind or earthquake may be resisted in the form of passive pressure on the site of footings and friction between the bottom of the footings and soils on which these are supported. The passive soil resistance against footings may be taken equal to a fluid having an equivalent fluid pressure of 250 p.c.f. This assumes that the footings are placed neat against the soil face or that properly compacted backfill is placed in the space between the footings and the soil faces. A coefficient of friction of 0.30 may be used.

14. Resistance to uplift developed by lateral loads is provided by the weight of the soil above the footing having a density of 120 p.c.f..



**Post-Tensioned Slab Foundation**

15. Post-tensioned slabs should be a minimum 8 inches in thickness and designed using the following criteria which is based on the design method of the 1997 Uniform Building Code, Chapter 18, Division III, Sections 1816 and 1817, Design of Post-Tensioned Slabs on Ground:

| | | |
|---|---|---|
| Liquid Limit | = | 67% |
| Plasticity Index | = | 46 |
| Allowable Bearing Capacity | = | 2,000 p.s.f. |
| Depth to Constant Moisture | = | 5 feet |
| Percent Passing #200 | = | 70% |
| Edge Moisture Variation Distance: | | |
| Edge Lift | = | 3.0 feet |
| Center Lift | = | 5.5 feet |

35. If planter areas are provided within or immediately adjacent to the pavement areas, provisions should be made to control irrigation water from entering pavement subgrade. Water entering the pavement section at subgrade level, which does not have a means for discharge, could cause softening of this zone and, subsequently, pavement failure will occur.

36. In order to mitigate this condition, it is recommended that the subgrade beneath curb and gutter be graded such that it has a positive fall towards the catch basins where a 2-foot long subdrain will discharge any accumulated water into the catch basin. The subdrain trench should be a minimum6 inches deep and consist of a 4-inch perforated solid wall PVC pipe surrounded and underlain by Class II permeable material. The inlet portion of the subdrain pipe should be capped.



**Utility Trenches**

37. Applicable safety standards require that trenches in excess of 5 feet must be properly shored or that the walls of the trench slope back to provide safety for installation of lines. If trench wall sloping is performed, the inclination should vary with the soil type. The underground contractor should request an opinion from the Soil Engineer as to the type of soil and the resulting inclination.

38. With respect to state-of-the-art construction or local requirements, utility lines are generally bedded with granular materials. These materials can convey surface or subsurface water beneath the structures. It is, therefore, recommended that all utility trenches which possess the potential to transport water underneath the foundation be sealed with a compacted impervious cohesive soil material or lean concrete where the trench enters/exits the building perimeter. This impervious seal should extend a minimum of 2 feet away from the building perimeter.

39. Utility trenches extending underneath all traffic areas must be backfilled with native or approved import material and compacted to relative compaction of 90% to within 6 inches of the subgrade. The upper 6 inches should be compacted to 95% relative compaction in accordance with Laboratory Test Procedure ASTM D1557-91. Backfilling and compaction of these trenches must

meet the requirements set forth by the City of Milpitas, Department of Public Works. Utility trenches within landscape areas may be compacted to a relative compaction of 85%.

**General Construction Requirements**

40. All finish grades should provide a positive gradient to an adequate discharge point in order to provide rapid removal of surface water runoff away from all foundations. No ponding of water should be allowed on the pad or adjacent to the foundations. Surface drainage must be provided as designed by the project Civil Engineer and maintained by the property owners at all times.

41. All surface and subsurface drainage must be collected in a solid pipe and drained into the storm drain system. Surface grades must slope away from the top of all slopes. Where possible surface water must not be directed toward any of the north or eastern slopes. Drainage systems must not outlet on to any slopes.



42. Liberal lot slopes and drainage must be provided by the project Civil Engineer to remove all storm water from the pad and to minimize storm and/or irrigation water from seeping beneath the structures. Should surface water be allowed to persistently seep under the structures, foundation movement resulting in structural cracking and damage will occur. Finished grades around the perimeter of all structures should be compacted and should be sloped at a minimum 2% gradient away from the exterior foundation. Should the recommended surface gradient be altered by the property owner such that the ground surface slopes toward the foundation and allows surface and irrigation water to pond along the foundation, foundation movement will occur. In this case, a subdrain system should be constructed around the perimeter of the structure. Specific recommendations for subdrain construction will be provided upon request. Surface drainage requirements constructed by the builder should be maintained during landscaping.

43. Continuous roof gutters are recommended. Downspouts from the gutters should be provided with closed pipe conduits to carry storm water away from the structures and graded

areas and, thus, reduce the possibility of soil saturation adjacent to the foundations and engineered fills.

44. Flower beds or planters are not preferred adjacent to the foundations because of the possibility of irrigation water affecting the foundations. Should planters be constructed, foliage requiring little irrigation should be planted. It is preferred that irrigation adjacent to the building foundations consist of a drip system. Sprinkler systems may be used, however, it is preferred that sprinkler heads do not water closer than 3 feet from the building foundations. If sprinklers are used within 3 feet, then excessive watering should not be allowed; and good surface drainage in the planter area must be provided. In any case, it is recommended that area surface drains be incorporated into the landscaping to discharge any excessive irrigation or rainwater that may accumulate in the planter area. These surface drains must be constructed such that the surface of the drain is lower than the surrounding grade so that easy flow of surface water runoff is allowed into the drip inlets. Ground cover and vegetation should be maintained to allow easy flow of water to drains. In particular, the creation of planter areas confined on all sides by concrete walkways or decks and the structure foundation is not desirable as any surface water due to rain or irrigation becomes trapped in the planter area with no outlet. If such a landscape feature is necessary, surface area drains in the planter area or a subdrain along the foundation perimeter must be installed.



**Project Review and Construction Monitoring**

45. All grading and foundation plans for the development must be reviewed by the Soil Engineer prior to contract bidding or submitted to governmental agencies so that plans are reconciled with soil conditions and sufficient time is allowed for suitable mitigative measures to be incorporated into the final grading specifications.

46. ***TERRASEARCH, inc.***, should be notified at least two working days prior to site clearing, grading, and/or foundation operations on the property. This will give the Soil Engineer ample time to discuss the problems that may be encountered in the field and coordinate the work with the contractor.

47. Field observation and testing during the grading and/or foundation operations must be provided by representatives of ***TERRASEARCH, inc.***, to enable them to form an opinion regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to the grading and/or foundation operations performed without the full knowledge and under the direct observation of the Soil Engineer will render the recommendations of this report invalid. This does not imply full-time observation. The degree of observation and frequency of testing services would depend on the construction methods and schedule, and the item of work. Please refer to "Guidelines For Required Services" for an outline of our involvement during project development.

48. Should another geotechnical consultant be engaged to perform project review and/or construction monitoring, then ***TERRASEARCH, inc.***, must receive a letter of indemnification releasing us of any responsibility on the project.

## GUIDELINES FOR REQUIRED SERVICES

The following list of services are the services required and must be provided by ***TERRASEARCH, inc.***, during the project development. These services are presented in check list format as a convenience to those entrusted with their implementation.

The items listed are included in the body of the report in detail. This list is intended only as an outline of the required services and does not replace specific recommendations and, therefore, must be used with reference to the total report. This does not imply full-time observation. The degree of observation and frequency of testing services would depend on the construction methods and schedule, and the item of work.

The importance of careful adherence to the report recommendations cannot be overemphasized. It should be noted, however, that this report is issued with the understanding that each step of the project development will be performed under the direct observation of ***TERRASEARCH, inc.***

The use of this report by others presumes that they have verified all information and assume full responsibility for the total project.

DRAFT

| | Item Description | Required | Not Required |
|---|---|---|---|
| 1. | Provide foundation design parameters | X | |
| 2. | Review grading plans and specifications | X | |
| 3. | Review foundation plans and specifications | X | |
| 4. | Observe and provide recommendations regarding demolition | X | |
| 5. | Observe and provide recommendations regarding site stripping | X | |
| 6. | Observe and provide recommendations on moisture conditioning, removal, and/or precompaction of unsuitable existing soils | X | |
| 7. | Observe and provide recommendations on the installation of subdrain facilities | X | |
| 8. | Observe and provide testing services on fill areas and/or imported fill materials | X | |
| 9. | Review as-graded plans and provide additional foundation recommendations, if necessary | X | |
| 10. | Observe and provide compaction tests on sanitary sewers, storm drain, water lines and PG&E trenches | X | |
| 11. | Observe foundation excavations and provide supplemental recommendations, if necessary prior to placing concrete | X | |
| 12. | Observe and provide moisture conditioning recommendations for foundation areas prior to placing concrete | X | |
| 13. | Provide design parameters for retaining walls | X | |
| 14. | Provide geologic observations and recommendations for keyway excavations and cutslopes during grading | X | |
| 15. | Excavate and recompact all geologic trenches and/or test pits | | X |
| 16. | Observe installation of subdrain behind retaining walls (if any) | | X |

## LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. It should be noted that it is the responsibility of the owner or his representative to notify ***TERRASEARCH, inc.***, a minimum of two working days before any clearing, grading, or foundation excavations can commence at the site.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings and/or test pits and from a reconnaissance of the site. Should any variations or undesirable conditions be encountered during the development of the site, ***TERRASEARCH, inc.***, will provide supplemental recommendations as dictated by the field conditions.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are brought to the attention of the Architect and Engineer for the project and incorporated into the plans and that the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.



4. At the present date, the findings of this report are valid for the property investigated. With the passage of time, significant changes in the conditions of a property can occur due to natural processes or works of man on this or adjacent properties. In addition, legislation or the broadening of knowledge may result in changes in applicable standards. Changes outside of our control may render this report invalid, wholly or partially. Therefore, this report should not be considered valid after a period of two (2) years without our review, nor should it be used, or is it applicable, for any properties other than those investigated.

5. Notwithstanding all the foregoing, applicable codes must be adhered to at all times.

**APPENDIX A**

**Field Investigation**

**Site Plan**

**Logs of Test Borings**

DRAFT

## FIELD INVESTIGATION

The field investigation was performed on 12 and 18 August 2003 and included a reconnaissance of the site and the drilling of twelve test borings at the approximate locations shown on Figure 1, "Site Plan."

The borings were drilled to a maximum depth of 36.5 feet below the existing ground surface. The drilling was performed with a truck-mounted rig using power-driven, 6-inch solid flight augers. Visual classifications were made from auger cuttings and the samples in the field. As the drilling, undisturbed core samples were obtained by means of a 2-1/2 inch O.D., split-tube sampler. The sampler was driven into the in-situ soils under the impact of a 140-pound hammer having a free fall of 30 inches. The number of blows required to advance the sampler 12 inches into the soil were adjusted to the standard penetration resistance (N-Value).



The samples were sealed and returned to our laboratory for testing. Classifications made in the field were verified in the laboratory after further examination and testing.

The stratification of the soils, descriptions, and location of undisturbed soil samples are shown on the "Logs of Test Borings" contained within this appendix.

Site Plan, Figure 1

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | B1-1 | ■ | | Medium brown silty CLAY / clayey SILT, low to moderate plasticity, dry, minor gravel to 1½" (subangular), stiff. | | 12 | 112.0 | 13.2 | |
| 5 | B1-2 | ■ | | Dark grey silty CLAY, damp, moderate plasticity, minor gravel subangular to ¾", stiff. | | 13 | 96.5 | 25.6 | |
| 10 | B1-3 | ■ | | Mottled tan / light brown, silty CLAY, moderate plasticity, damp, stiff. | | 15 | 108.2 | 19.4 | |
| | | | | Yellowish brown, silty CLAY, moderate plasticity, moist to very moist, stiff. | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | See figure 3 sheet 2 of 2 for continuation. | | | | | |

DRAFT

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.K. | 08/12/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-1

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-6662

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 3

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 00/2003 | 1 of 2 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 36 | B1-4 | | | SAME AS PREVIOUS.<br>Yellowish (to greenish) brown, silty CLAY, very moist, moderate to high plasticity, very stiff. | | 24 | | | |
| 40 | | | | | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | Boring terminated @ 50' below ground surface.<br>Groundwater encountered @ 15'.<br>Static groundwater @ 8'. | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | | | | | | |
| 65 | | | | | | | | | |
| 70 | | | | | | | | | |



| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/12/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-1

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-5562

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 3

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 2 of 2 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Light brown, silty CLAY, damp, moderate plasticity, few organics, stiff. | | | | | |
| | B2-1 | | | | | 11 | 98.6 | 20.8 | LL = 33<br>PI = 13 |
| 5 | | | | Medium brown, silty CLAY, damp, medium to high plasticity, stiff. | | | | | |
| | | | | DRAFT | | | | | |
| 10 | B2-2 | | | | | 12 | 102.3 | 22.1 | |
| 15 | | | | Boring terminated @ 15' below ground surface.<br>Groundwater encountered @ 14'.<br>Static groundwater @ 9'. | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/12/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-2

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
267 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-8662

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 4

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Medium brown, silty CLAY, dry to damp, moderate mplasticity, some fine sand, firm. Becoming sandy with depth. | | | | | |
| 5 | B3-1 | | | DRAFT | | 5 | 106.9 | 15.8 | LL = 26<br>PI = 9 |
| | | | | Grey brown, silty SAND, wet, fine to medium grained. | | | | | |
| 10 | B3-2 | | | | | ? | 104.3 | 20.6 | |
| | | | | A 6" thick lense of gravel. | | | | | |
| 15 | | | | Yellowish brown, silty CLAY, moderate to high plasticity, very moist. | | | | | |
| 20 | | | | Grading to sandy CLAY. | | | | | |
| 25 | | | | Boring terminated @ 25' below ground surface.<br>Groundwater encountered @ 9'.<br>Static groundwater @ 7½'. | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/12/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-3

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
267 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 245-8882

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 5

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Medium brown, silty CLAY, dry to damp, occasional gravel angular to subrounded to 1", stiff. | | | | | |
| 5 | B4-1 | | | Grey brown, silty CLAY, damp, moderate plasticity, very stiff. | | 17 | 98.5 | 23.5 | |
| 10 | | | | Boring terminated @ 15' below ground surface. Static groundwater @ 10'. | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |



| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/12/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-4

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-8882

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 6

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACKEM | 1" = 5' | 08/2003 | 1 of 1 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Medium brown, clayey gravelly SAND, fine to coarse grained, damp, gravel subrounded to ¾", medium dense. | | | | | |
| | B5-1 | | | Gravel / sand decreasing. | | 6 | 110.4 | 13.5 | |
| 5 | | | | Dark grey brown, silty CLAY, damp, moderate plasticity, some organics, stiff. | | | | | |
| | B5-2 | | | | | 15 | 96.6 | 27.0 | |
| 10 | | | | Yellow brown, silty CLAY, moist stiff. Color change to yellow brown. | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | Boring terminated @ 30' below ground surface. Groundwater encountered @ 15'. Static groundwater @ 11'. | | | | | |
| 35 | | | | | | | | | |



| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/12/03 | 6" | B3500 |

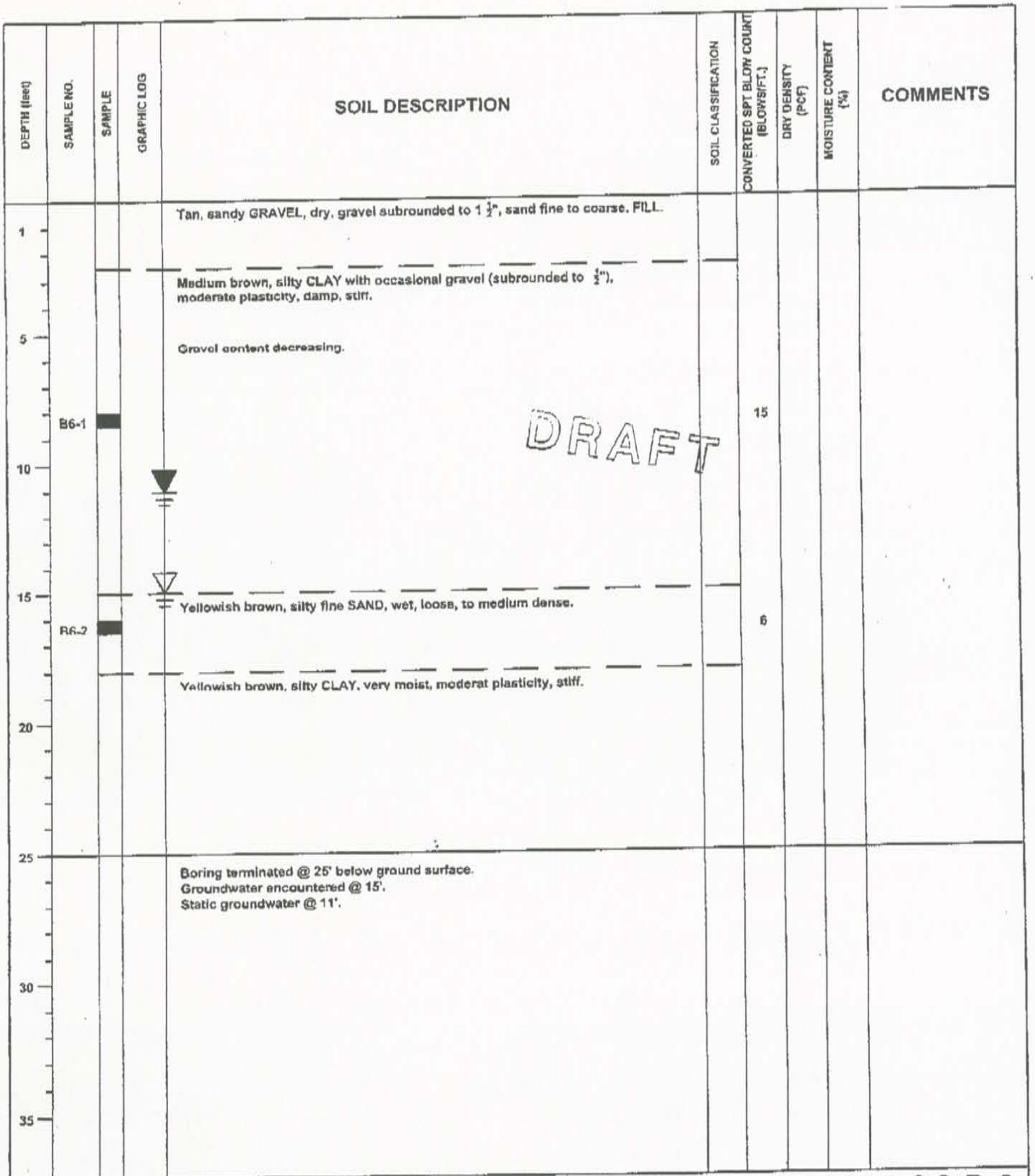
# EXPLORATORY BORING LOG B-5

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-8862

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 7

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |




| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/12/03 | 6" | B3500 |

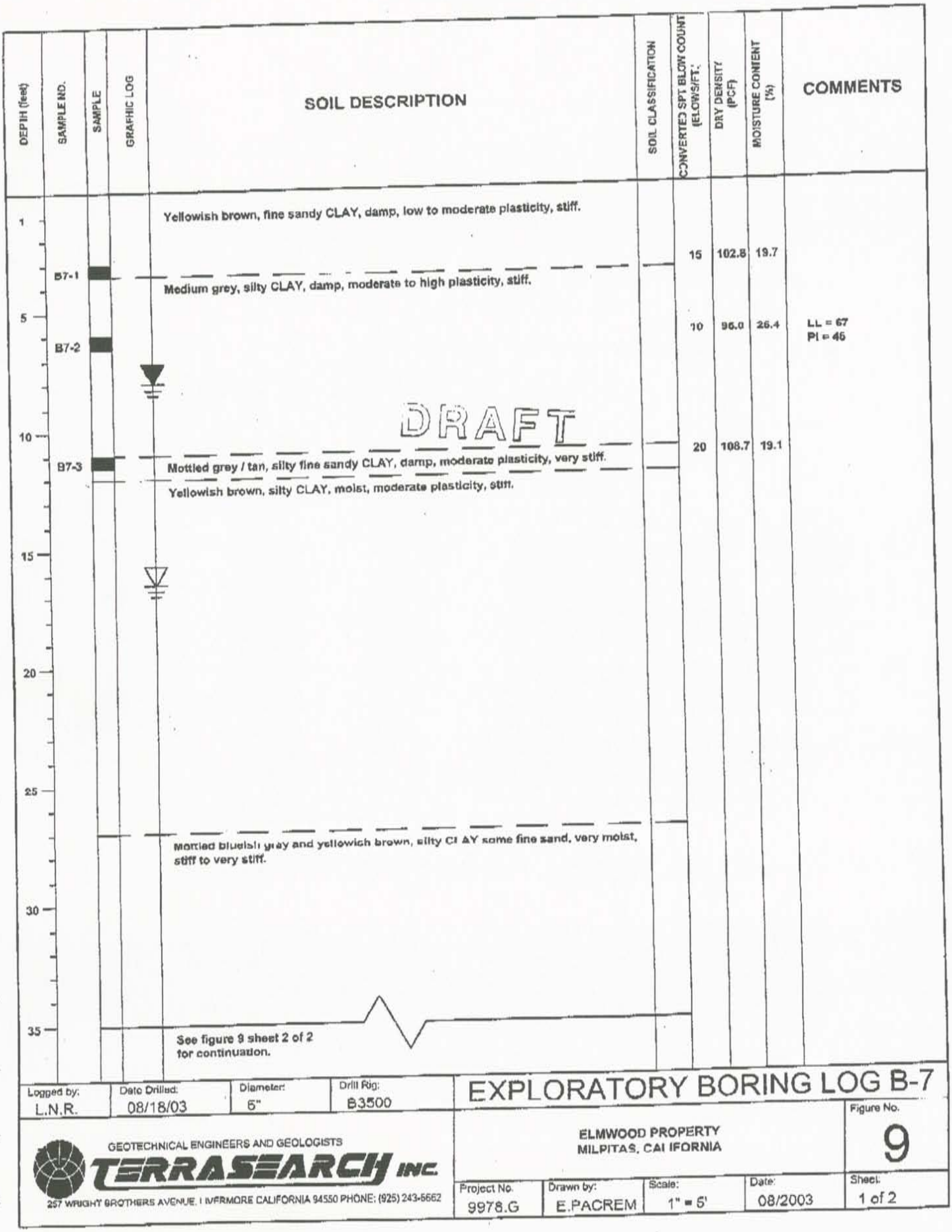
# EXPLORATORY BORING LOG B-6

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-8682

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 8

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 99/8.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |






| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 5" | B3500 |

# EXPLORATORY BORING LOG B-7

GEOTECHNICAL ENGINEERS AND GEOLOGISTS

TERRASEARCH INC.

257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-5662

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 9

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 2 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 36 | | | | Same as previuos. | | | | | |
| | | | | Medium brown, silty CLAY, very moist, stiff. | | | | | |
| 40 | | | | | | | | | |
| | | | | DRAFT | | | | | |
| 45 | | | | | | | | | |
| 50 | | | | Boring terminated @ 50' below ground surface.<br>Groundwater encountered @ 16 ½'.<br>Static groundwater @ 8'. | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | | | | | | |
| 65 | | | | | | | | | |
| 70 | | | | | | | | | |

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-7

GEOTECHNICAL ENGINEERS AND GEOLOGISTS

TERRASEARCH INC.

257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-6662

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 9

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.C | E.PACREM | 1" = 5' | 08/2003 | 2 of 2 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Medium brown to dark grey, silty CLAY with fine sand, damp, low to moderate plasticity, stiff. | | 12 | 105.0 | 13.5 | LL = 38<br>PI = 18 |
| | B8-1 | | | | | | | | |
| 5 | | | | Yellowish brown, clayey fine SAND, damp, medium dense. | | 9 | 104.8 | 10.4 | |
| | B8-2 | | | DRAFT | | | | | |
| | | | | Yellowish brown, clayey SILT with fine sand, wet, moderate plasticity, soft to firm. | | | | | |
| 10 | | | | | | 4 | 90.6 | 31.8 | |
| | B8-3 | | | Yellowish brown to grey, mottled, silty CLAY some fine sand, moist, moderate plasticity, stiff. | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | Boring terminated @ 20' below ground surface<br>Groundwater encountered @ 15'.<br>Static groundwater @ 13½'. | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-8

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 245-7562

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 10

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Medium brown, clayey SILT / silty CLAY, dry to damp, low plasticity, some organics, very stiff. | | | | | |
| | B9-1 | ■ | | | | 27 | 106.5 | 14.5 | |
| 5 | | | | Medium to yellow brown, clayey SILT with fine sand, dry to damp, stiff. | | 11 | 113.0 | 14.1 | |
| | B9-2 | ■ | | Yellowish brown, clayey fine SAND, very moist, loose. | | | | | |
| | | | | DRAFT | | | | | |
| 10 | | | | | | 4 | 107.8 | 17.0 | Grain size. |
| | B9-3 | ■ | | Mottled yellow brown / brown grey, silty CLAY, moderate plasticity, damp to moist. | | | | | |
| 15 | | | | | | 6 | 98.1 | 24.8 | |
| | B9-4 | ■ | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | See figure 11 sheet 2 of 2 for continuation. | | | | | |

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-9

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-8882

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 11

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 2 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 36 | | | | Same as previous. | | | | | |
| 40 | | | | Yellow brown, gravelly CLAY, moderate plasticity, very moist, pea size gravel. | | | | | |
| 45 | | | | Blueish grey, silty CLAY, moderate plasticity, very moist. | | | | | |
| 50 | | | | Boring terminated @ 50' below ground surface.<br>Groundwater encountered @ 9'.<br>Static groundwater @ 9'. | | | | | |
| 55 | | | | | | | | | |
| 60 | | | | | | | | | |
| 65 | | | | | | | | | |
| 70 | | | | | | | | | |



| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-9

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-5552

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 11

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.6 | E.PACREM | 1" = 5' | 08/2003 | 2 of 2 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | B11-1 | ■ | | Yellowish brown, silty CLAY / clayey SILT, dry to damp, low to moderate plasticity, very stiff. | | 18 | 101.2 | 12.9 | |
| 5 | B11-2 | ■ | ▽ | Medium brown, silty CLAY with some organics, damp, moderate plasticity, stiff. | | 14 | 94.6 | 22.4 | |
| 10 | B11-3 | ■ | ▽ | Yellowish brown, clayey SILT with some fine sand, moderate plasticity, very moist, firm. | | 7 | 104.2 | 21.8 | |
| 15 | | | | Moisture increasing. | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | Boring terminated @ 25' below ground surface.<br>Groundwater encountered @ 11'.<br>Static groundwater @ 7'. | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |



| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 6" | B3500 |

# EXPLORATORY BORING LOG B-11

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-6682

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 13

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |

| DEPTH (feet) | SAMPLE NO. | SAMPLE | GRAPHIC LOG | SOIL DESCRIPTION | SOIL CLASSIFICATION | CONVERTED SPT BLOW COUNT (BLOWS/FT.) | DRY DENSITY (PCF) | MOISTURE CONTENT (%) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Medium brown & yellow brown, fine sandy SILT some clay, dry to damp, firm to stiff. | | | | | |
| | B12-1 | | | | | 8 | 104.2 | 15.9 | |
| 5 | | | | | | | | | |
| | B12-2 | | | | | 8 | 102.4 | 20.9 | |
| | | | | Yellow brown, silty CLAY with fine sand, moist, stiff. | | | | | |
| 10 | | | | DRAFT | | | | | |
| | B12-3 | | | | | 12 | 100.6 | 20.6 | |
| 15 | | | | Boring terminated @ 15' below ground surface. Groundwater encountered @ 14½'. Static groundwater @ 13'. | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

| Logged by: | Date Drilled: | Diameter: | Drill Rig: |
|---|---|---|---|
| L.N.R. | 08/18/03 | 5" | B3500 |

# EXPLORATORY BORING LOG B-12

GEOTECHNICAL ENGINEERS AND GEOLOGISTS
TERRASEARCH INC.
257 WRIGHT BROTHERS AVENUE, LIVERMORE CALIFORNIA 94550 PHONE: (925) 243-6662

ELMWOOD PROPERTY
MILPITAS, CALIFORNIA

Figure No. 14

| Project No. | Drawn by: | Scale: | Date: | Sheet: |
|---|---|---|---|---|
| 9978.G | E.PACREM | 1" = 5' | 08/2003 | 1 of 1 |

DRAFT

# APPENDIX B

## Laboratory Investigation

## Summary of Laboratory Test Results

## LABORATORY INVESTIGATION

The laboratory testing program was directed towards providing sufficient information for the determination of the engineering characteristics of the site soils so that the recommendations outlined in this report could be formulated.

Moisture content and dry unit weight tests were performed on undisturbed soil samples in order to determine the consistency of the soil and moisture variation throughout the explored soil profile and estimate the compressibility of the underlying soils.

The expansion characteristics of the near-surface soils were evaluated by means of Atterberg Limits tests performed in accordance with ASTM D4318 and swell tests.

A summary of all laboratory test results is presented on Table I of this appendix.

# TABLE I

## Summary of Laboratory Test Results

| | | | | Atterberg Limits | |
|---|---|---|---|---|---|
| Sample No. | Depth (ft.) | Dry Density (p.c.f.) | Moisture Content (% Dry Wt.) | Liquid Limit (%) | Plasticity Index |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

DRAFT

# APPENDIX C

## The Grading Specifications

## Guide Specifications for Rock Under Floor Slabs

# THE GRADING SPECIFICATIONS
## On
## Elmwood Property
## Abel Street
## Milpitas, California



## 1. General Description

1.1 These specifications have been prepared for the grading and site development of the subject development. ***TERRASEARCH, inc.***, hereinafter described as the Soil Engineer, should be consulted prior to any site work connected with site development to ensure compliance with these specifications.

1.2 The Soil Engineer should be notified at least two working days prior to any site clearing or grading operations on the property in order to observe the stripping of organically contaminated material and to coordinate the work with the grading contractor in the field.

1.3 This item shall consist of all clearing or grubbing, preparation of land to be filled, filling of the land, spreading, compaction and control of fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades, and slopes as shown on the accepted plans. The Soil Engineer is not responsible for determining line, grade elevations, or slope gradients. The property owner, or his representative, shall designate the person or organizations who will be responsible for these items of work.

1.4 The contents of these specifications shall be integrated with the soil report of which they are a part, therefore, they shall not be used as a self-contained document.

## 2. Tests

The standard test used to define maximum densities of all compaction work shall be the ASTM D1557-91 Laboratory Test Procedure. All densities shall be expressed as a relative compaction in terms of the maximum dry density obtained in the laboratory by the foregoing standard procedure.

## 3. Clearing, Grubbing, and Preparing Areas To Be Filled

3.1 If encountered, all vegetable matter, trees, root systems, shrubs, debris, and organic topsoil shall be removed from all structural areas and areas to receive fill.

3.2 If encountered, any soil deemed soft or unsuitable by the Soil Engineer shall be removed. Any existing debris or excessively wet soils shall be excavated and removed as required by the Soil Engineer during grading.

3.3 All underground structures shall be removed from the site such as old foundations, abandoned pipe lines, septic tanks, and leach fields.

3.4 The final stripped excavation shall be approved by the Soil Engineer during construction and before further grading is started.

3.5 After the site has been cleared, stripped, excavated to the surface designated to receive fill, and scarified, it shall be disked or bladed until it is uniform and free from large clods. The native subgrade soils shall be moisture conditioned and compacted to the requirements as specified in the grading section of this report. Fill can then be placed to provide the desired finished grades. The contractor shall obtain the Soil Engineer's approval of subgrade compaction before any fill is placed.

GRC
Attn:Lester

East San Gabriel
Commercial Development

20040929

| Zip5 | Zip4 | CityCt | HomeCt | AptCt | SpaceCt | RuralCt | ResDelCt | FirmCt | PossDelCt |
|---|---|---|---|---|---|---|---|---|---|
| 91770 Total | | 36 | 24 | 12 | 0 | 0 | 36 | 5 | 41 |
| 91775 Total | | 478 | 190 | 288 | 0 | 0 | 478 | 37 | 515 |
| 91776 Total | | 1109 | 532 | 577 | 0 | 0 | 1109 | 458 | 1567 |
| 91780 Total | | 11 | 11 | 0 | 0 | 0 | 11 | 0 | 11 |
| Grand Total | | 1634 | 757 | 877 | 0 | 0 | 1634 | 500 | 2134 |

## 4. Materials

4.1 All fill material shall be approved by the Soil Engineer. The material shall be a soil or soil-rock mixture which is free from organic matter or other deleterious substances. The fill material shall not contain rocks or lumps over 6 inches in greatest dimension and not more than 15% larger than 2-1/2 inches. Materials from the site below the stripping depth are suitable for use in fills provided the above requirements are met.



4.2 Materials existing on the site are suitable for use as compacted engineered fill after the removal of all debris and organic material. All fill soils shall be approved by the Soil Engineer in the field.

4.3 Should import material be required, it must meet the specifications as delineated in the body of this report.

## 5. Placing, Spreading, and Compacting Fill Material

5.1 The fill materials shall be placed in uniform lifts of not more than 8 inches in uncompacted thickness. Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to obtain uniformity of material in each layer. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction by either (a) aerating the material if it is too wet, or (b) spraying the material with water if it is too dry.

5.2 After each layer has been placed, mixed, and spread evenly, either import material or native material shall be compacted to a relative compaction designated for engineered fill.

5.3 Compaction shall be by footed rollers or other types of acceptable compacting rollers. Rollers shall be of such design that they will be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to ensure that the required density has been obtained. No ponding or jetting shall be permitted.

5.4 Field density tests shall be made in each compacted layer by the Soil Engineer in accordance with Laboratory Test Procedure ASTM D1556-64 or D2922-71. When footed rollers are used for compaction, the density tests shall be taken in the compacted material below the surface disturbed by the roller. When these tests indicate that the compaction requirements on any layer of fill, or portion thereof, has not been met, the particular layer, or portion thereof, shall be reworked until the compaction requirements have been met.



5.5 No soil shall be placed or compacted during periods of rain nor on ground which contains free water. Soil which has been soaked and wetted by rain or any other cause shall not be compacted until completely drained and until the moisture content is within the limits hereinbefore described or approved by the Soil Engineer. Approval by the Soil Engineer shall be obtained prior to continuing the grading operations.

## 6. Pavement

6.1 The proposed subgrade under pavement sections, native soil, and/or fill shall be compacted to a minimum relative compaction of 95% at 3% above optimum moisture content for a depth of 6 inches.

6.2 All aggregate base material placed subsequently should also be compacted to a minimum relative compaction of 95% based on the ASTM Test Procedure D1557-91. The construction of the pavement in the parking and traffic areas should conform to the requirements set forth by the latest Standard Specifications of the Department of Transportation of the State of California and/or City of Milpitas Department of Public Works

of Williams, Department of Public Works.